
**THE
SIX SIGMA BLACK BELT
SOLUTION TEXT**

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WITH A LITTLE HELP FROM MY FRIENDS.

JOHN LENNON/PAUL McCARTNEY

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We would appreciate any comments regarding improvement and errata. It is our concern to be accurate.

**Bill Wortman
Quality Council of Indiana
602 West Paris Avenue
West Terre Haute, IN 47885
(Toll-free) 800-431-1585
(Voice) 812-533-4215
(Fax) 812-533-4216
qci@qualitycouncil.com
<https://www.qualitycouncil.com>**

SECTION III

PROCESS MANAGEMENT - SAMPLE QUESTIONS

- 3.1. What three strategy elements does Harry include with the traditional DMAIC approach to six sigma?
- R, S, I
 - R, P, S
 - S, I, C
 - S, P, P

Solution: Harry includes an initial element (R): Recognize the true state of your business.

He also adds and two concluding elements (S and I):

Standardize the systems that prove to be best-in-class.

Integrate best-in-class systems into the strategic planning framework.

Answer a is correct.

Reference: *CSSBB Primer*, Section III - 6/7.

- 3.2. What key step would follow an evaluation of current practices against a benchmark?
- Identifying key performance factors
 - Selecting performance criteria based on priorities
 - Determining a leader in a critical performance area
 - Undertaking significant changes to advance performance

Solution: The key question word is "follow." Answers (Identifying key performance factors), (Selecting performance criteria based on priorities), and (Determining a leader in a critical performance area) would traditionally come before a benchmark comparison. The action indicated in answer choice (Undertaking significant changes to advance performance) would come after a benchmark comparison.

Answer d is correct.

Reference: *CSSBB Primer*, Section III - 12/14.

- 3.3. The customer retention rate is noted to be:
- 1 minus the attrition rate
 - 1 plus the churn rate
 - The attrition rate minus the churn rate
 - The attrition rate divided by the churn rate

Solution: The attrition rate is also called the churn rate. The customer retention rate equals 1 minus the attrition rate.

Answer a is correct.

Reference: *CSSBB Primer*, Section III - 18.

SECTION III

PROCESS MANAGEMENT - SAMPLE QUESTIONS

- 3.4. The techniques known as the balanced scorecard measures such perspectives as:
- Payback period and the IRR method
 - Financial and customer concerns
 - Periodic reviews and senior management vision
 - Traditional costs and costs of poor quality

Solution: Answer "Payback period and the IRR method" relates to cost benefit measures. Answer "Traditional costs and costs of poor quality" describes quality cost concerns. Answer "Periodic reviews and senior management vision" describes balanced scorecard building steps.

The four balanced scorecard considerations are:

- Financial
- Internal business processes
- Learning and growth
- Customers

Two of these four items are included in answer "Financial and customer concerns".

Answer b is correct.

Reference: *CSSBB Primer*, Section III - 19.

- 3.5. In the event that company A benchmarks company B for a particular process and then develops a breakthrough concept, what is considered to be the most ethical approach to take?
- Share the total results with the benchmark partner B
 - Share the results up to the benchmarked level with partner B
 - Protect the improvement if the benchmarked partner B is a competitor
 - Share the breakthrough advance only if directly asked by benchmarked partner B

Solution: Assuming that benchmark partner B was a knowing, willing partner, then the only ethical recourse is to share the total results with company B.

Answer a is correct.

Reference: *CSSBB Primer*, Section III - 13.

SECTION III

PROCESS MANAGEMENT - SAMPLE QUESTIONS

- 3.6. A company wants to determine customer loyalty. One possible measure is:
- How many online negative reviews they had posted recently
 - Their annual gross income
 - How many purchases they had made over the past year
 - If they are a homeowner, how many years they lived in the current home

Solution: Some measures of customer loyalty include:

- Are you a repeat customer?
- Are you a returning customer?
- How frequently do you buy our products?
- Do you use only our products?
- How likely are you to buy additional materials?

Answer c is correct.

Reference: *CSSBB Primer*, Section III - 18.

- 3.7. The percentages of total quality cost are distributed as follows: prevention 12%; appraisal 28%; internal failure 40%; and external failure 20%. One would conclude:
- More money should be invested in prevention
 - Expenditures for failure are excessive
 - The amount spent for appraisal seems about right
 - Nothing

Solution: Given cost category percentages, the question asks for a conclusion. No information is given regarding the actual dollar amounts spent, any applicable cost comparison base, the type of industry, or quality cost history. No conclusion can be reached.

Answer d is correct.

References: *CSSBB Primer*, Section III - 27/34. This question has been modified from an old CQE Brochure.

- 3.8. A positive KBI that an organization would consider when evaluating employees is:
- How many overtime hours per week the person is willing to work
 - Whether the person is over 65 years of age
 - The number of miles the person commutes to work each day
 - How well the person works on teams

Solution: Employers are looking for positive behavior indicators such as: Developing solutions to problems, Integrating well with others, Adapting to new ideas, Responding well to criticism, and Processing feedback and learning from others.

Answer d is correct.

Reference: *CSSBB Primer*, Section III - 20.

SECTION III

PROCESS MANAGEMENT - SAMPLE QUESTIONS

- 3.9. A six sigma project requires \$23,000 of initial investment and training costs of \$6,000, spread over a 6 month period. The project is expected to save the company \$3,000 per month, starting in the third month. Ignoring interest and taxes, what is the payback period?
- a. 9 months
 - b. 10 months
 - c. 11 months
 - d. 12 months

Solution: The formula for calculating the payback period is:

$$\text{Payback period} = \frac{\text{Initial (\& Incremental) Investment}}{\text{Annual (Monthly) Cash Inflow}}$$

Since the question information suggests that the money will not be repaid in less than 6 months, both the \$23,000 and \$6,000 expenses can be added together. It should be noted that the payback will not start until the 3rd month. Therefore, the calculation becomes:

$$\begin{aligned}\text{Payback period} &= \frac{\$29,000}{\$3,000 / \text{month}} + 2 \text{ months} \\ &= 9.67 \text{ months} + 2 \text{ months} = 11.67 \text{ months}\end{aligned}$$

The first positive payback month will be the 12th month.

Answer d is correct.

Reference: *CSSBB Primer*, Section III - 22/24.

- 3.10. One would say, from an overall perspective, the activities of a company are tied together by:
- a. Customers
 - b. Stockholders
 - c. Suppliers
 - d. Process management

Solution: In the context of the question, almost any model or schematic of an organization has either a business process management or internal company process at its core.

Answer d is correct.

Reference: *CSSBB Primer*, Section III - 8/10.